

## **CLAIMS**

### **What is claimed is:**

1. A method for satisfying a Quality of Service (QoS) contract with an initiator, comprising:
  - receiving a request from an initiator in a first time less than or equal to an ordinal number times an arrival interval, wherein the ordinal number signifies a position of the request among a group of requests; and
  - returning the request that has been serviced to the initiator in a second time less than or equal to a constant term plus the ordinal number times a service interval.
2. The method of claim 1, further comprising:
  - measuring the first and second time at a boundary between the initiator and an interconnect.
3. The method of claim 2, further comprising:
  - satisfying the QoS contract using the initiator, the target, the interconnect, and a QoS unit.
4. The method of claim 1, wherein the service interval is greater than the arrival interval.

5. The method of claim 1, wherein the service interval is equal to the arrival interval.
6. The method of claim 1, further comprising:  
determining the constant term specifically for the group of requests.
7. A system, comprising:  
an interconnect coupled between an initiator and a target; and  
a logic coupled to the interconnect configured to satisfy a service model if the initiator satisfies an arrival model, wherein the arrival model is satisfied by the initiator if a request arrives before a first time less than or equal to an ordinal number times an arrival interval, wherein the ordinal number signifies a position of the request among a group of requests; and  
wherein the logic satisfies the service model if the request is serviced before a second time less than or equal to a constant term plus the ordinal number times a service interval.
8. The system of claim 7, wherein the service interval is greater than the arrival interval.
9. The system of claim 7, wherein the constant term is determined specifically for the group of requests.

10. The system of claim 7, wherein the logic includes a Quality of Service (QoS) unit to guide the interconnect.
11. The system of claim 10, wherein the QoS unit is coupled between the target and the interconnect.
12. The system of claim 7, wherein the arrival model and the service model comprise a QoS contract.
13. The system of claim 12, wherein the QoS contract is satisfied at a boundary between the initiator and the interconnect.
14. The system of claim 10, wherein the QoS unit is part of the interconnect.
15. The system of claim 10, wherein the QoS unit is part of the target.
16. A method for tracking service comprising:
  - maintaining a first allocation count for a first thread to track whether the first thread is being serviced;
  - establishing a positive limit having a first value for the first allocation count; and

raising the positive limit to a second value when a second thread having a second allocation count is serviced and the second allocation count is positive.

17. The method of claim 16, further comprising:

reducing the positive limit from the second value to a third value when the second allocation count receives a credit and is positive.

18. The method of claim 17, wherein the positive limit is not reduced below the first value.

19. The method of claim 16, further comprising:

crediting the first and second allocation count at a regular interval; debiting the first allocation count when the first thread is serviced; and debiting the second allocation count when the second thread is serviced.

20. The method of claim 16, wherein raising comprises increasing the positive limit by an amount proportional to an allocation rate of the first thread.

21. The method of claim 20, wherein the amount comprises a number of times the second thread was serviced times the allocation rate of the first thread.

22. The method of claim 17, further comprising:  
determining whether the first thread will be serviced according to the  
first allocation count.
23. The method of claim 22, further comprising:  
servicing the first thread instead of the second thread when the second  
allocation count is less than the first allocation count.
24. The method of claim 16, wherein the second thread is a high-priority  
thread.
25. The method of claim 24, wherein the first thread is a bandwidth-  
allocation thread.
26. A system, comprising:  
a interconnect coupled to an initiator and a target;  
a first logic coupled to the interconnect, and configured to maintain a  
first allocation count for a first thread to track bandwidth usage by the first  
thread;  
a second logic coupled to the first logic , and configured to establish a  
positive limit having a first value for the first allocation count; and

a third logic coupled to the second logic, and configured to raise the positive limit to a second value when a second thread having a second allocation count is serviced and the second allocation count is positive.

27. The system of claim 26, further comprising:
  - a fourth logic coupled to the second logic, and configured to reduce the raised positive limit to a third value when the second allocation count receives a credit and is positive.
28. The system of claim 26, wherein the positive limit is raised by an amount proportional to an allocation rate of the first thread.
29. The system of claim 26, wherein the first thread is a bandwidth allocation thread.
30. The system of claim 26, wherein the second thread is a high-priority thread.
31. The system of claim 26, further comprising:
  - a fifth logic coupled to the interconnect and the first logic, the fifth logic is configured to satisfy a service model if an arrival model is satisfied by the initiator, and wherein the fifth logic uses the first allocation count to satisfy the service model.

32. The system of claim 31, wherein the arrival model is satisfied by the initiator if a request arrives before a first time less than or equal to an ordinal number times an arrival interval, wherein the ordinal number signifies a position of the request among a group of requests; and

wherein the service model is satisfied if the request is serviced before a second time less than or equal to a constant term plus the ordinal number times a service interval.